REMARKS/ ARGUMENTS

Claims 1, 3, 8, and 16 were rejected under 35 U.S.C. 102(b) as being anticipated by Vidalin (US 2002/0085963 A1).

Claims 1, 5 to 7, and 10 were rejected under 35 U.S.C. 102(e) as being anticipated by Barbir (US2004/0142215 A1).

Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over Barbir in view of Michelfelder (US 4,461,224).

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Barbir in view of Faye (US 2003/0170514).

Claims 9, and 11 to 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barbir in view of Keefer (US 2002/0098394 A1).

Reconsideration of the application based on the following remarks is respectfully requested.

Rejection under 35 U.S.C. §102(b)

Claims 1, 3, 8, and 16 were rejected under 35 U.S.C. 102(b) as being anticipated by Vidalin (US 2002/0085963 A1).

Vidalin discloses a system for synthesizing acetic acid from carbon monoxide and methanol (see Figure 2). A hydrocarbon is fed into a reformer, where it is reformed in the presence of a hydrocarbon reformation catalyst (paragraph [0006]), producing an effluent syngas (abstract). A portion of the effluent is diverted to a CO_2 removal unit 22 along line 20 (paragraph [0051]). The CO_2 removal unit 22 separates the effluent into a CO_2 stream 24 and a CO/H_2 stream 26 (paragraph [0051]). The CO_2 stream 24 then returns CO_2 to the reformer 10 (paragraph [0052]), while the CO/H_2 stream 26 containing primarily CO and hydrogen can be separated in a CO separation unit 28 into a CO stream 30 and a hydrogen stream 32 (paragraph [0056]). The separated CO can then be reacted with methanol to produce acetic acid (paragraph [0008]).

Claim 1 recites a gas generating system, comprising:

a reformer for producing a hydrogen-containing reformate gas using raw materials, at least a first of the raw materials containing carbon and hydrogen;

a separator device configured to selectively separate the hydrogen-containing reformate gas into hydrogen and a residual gas;

a recirculation system for recirculating an amount of the residual gas from a first location downstream of the separator device to a second location upstream from the separator device.

Vidalin does not show "a separator device configured to selectively separate the hydrogen-containing reformate gas into hydrogen and a residual gas," as claimed in claim 1. The CO_2 removal unit 22 in Vidalin separates an effluent of the reformer 10 into a CO_2 stream 24 and a CO/H_2 stream 26. The CO_2 removal unit 22 in Vidalin thus does not selectively separate hydrogen as claimed, but rather hydrogen remains mixed and only a CO_2 stream is separated out.

Withdrawal of the rejection under 35 U.S.C. §102 (b) of claims 1, 3, 8 and 16 is respectfully requested.

Furthermore, with respect to claim 16, Vidalin does not show "the gas generation system as recited in claim 1, wherein the residual gas includes hydrogen," as recited in claim 16. The Office Action asserts that residual gas recited in claim 16, which is recirculated, "includes some hydrogen" and cites paragraphs 52 and 55 of Vidalin for support. However, paragraphs 52 and 55, it is respectfully submitted, do not mention the gas being sent along stream 24 from the CO_2 removal unit 22 containing any hydrogen, only CO_2.

Rejection under 35 U.S.C. §102(e)

Claims 1, 5 to 7, and 10 were rejected under 35 U.S.C. 102(e) as being anticipated by Barbir (US2004/0142215 A1).

Barbir discloses an electrochemical hydrogen compressor for an electrochemical cell system. It shows a fuel cell with a fuel cell hydrogen inlet and a fuel cell hydrogen outlet. (abstract). Unconsumed hydrogen that is exhausted from the fuel cell is compressed by the electrochemical hydrogen compressor and recirculated back to the hydrogen inlet. (paragraph [0022]). The compressor may also be used to recirculate hydrogen back into a fuel cell when hydrogen is exhausted from the fuel as a reformate, a

mixture of gases. To avoid "lowering the lowering of the hydrogen concentration at the cell stack inlet, which in turn may result in the loss in voltage across the cell stack and decreased power and efficiency" the compressor "allows for recirculation of the hydrogen constituent of the reformate gas while not recirculating the other gases of the reformate." (paragraph [0042])

Claim 1 recites a gas generating system, comprising:

a reformer for producing a hydrogen-containing reformate gas using raw materials, at least a first of the raw materials containing carbon and hydrogen;

a separator device configured to selectively separate the hydrogen-containing reformate gas into hydrogen and a residual gas;

a recirculation system for recirculating an amount of the residual gas from a first location downstream of the separator device to a second location upstream from the separator device.

Barbir does not show "a recirculation system for recirculating an amount of the residual gas from a first location downstream of the separator device to a second location upstream from the separator device." Barbir does not teach recirculating the residual gases, but only recirculating the hydrogen constituent. In fact, Barbir states that recirculating other gases with hydrogen results in "decreased power and efficiency." (paragraph [0042]). Therefore, Barbir does not disclose a recirculation system according to the present invention and actually teaches away from such a system.

Withdrawal of the rejection under 35 U.S.C. §102 (e) of claims 1, 5 to 7, and 10 is respectfully requested.

With further respect to claim 5, claim 5 recites "the gas generation system as recited in claim 1, wherein the separator device includes at least one diaphragm selectively permeable for hydrogen." Barbir does not disclose a diaphragm selectively permeable for hydrogen. The Office Action misstates the claimed language and asserts that "Barbir discloses a diaphragm pump that selectively pumps hydrogen for a recirculating system as a transport device." However, Barbir does not disclose the diaphragm pump as being selective, or even being used as part of the electrochemical hydrogen compressor (which the examiner asserts is a separator). The diaphragm pump is disclosed as an alternative to the electrochemical hydrogen compressor for the

"recirculation of unconsumed hydrogen gas." (paragraph [0031]). Barbir does not disclose that the diaphragm pump has a diaphragm selectively permeable for hydrogen, it simply discloses that the diaphragm pump can act as a mechanism to drive hydrogen gas out of a fuel cell. (paragraph [0031]). Such a pump is nonselective and will pump anything that gets in front of the suction mouth.

Withdrawal of the rejection under 35 U.S.C. §102 (e) of claim 5 and its dependent claims is respectfully requested.

Rejections under 35 U.S.C. §103(a)

Claim 2 was rejected under 35 U.S.C. 103(a) as being unpatentable over Barbir in view of Michelfelder (US 4,461,224).

Barbir is described above.

Michelfelder discloses "a method of treating reaction products which result from the flame combustion of fuels containing contaminants such as sulfur, chlorine, and fluorine compounds, and ash." (abstract). Its purpose is to restrict "the emission of these gaseous contaminants" to permissible values. (Col. 1, Lines 11-14). It is apparent from the specification that the invention is related to the field of waste incineration systems and flue-gas purification systems.

Claim 2 recites "the gas generation system as recited in claim 1, wherein the second location is directly in front of the separator device."

In view of arguments with respect to claim 1, withdrawal of the rejection to claim 2 is respectfully requested.

Furthermore, as admitted in the Office Action, Barbir does not disclose "the second location directly in front of the separator device" as claimed in claim 2. One skilled in the art would not modify Barbir in view of Michelfelder. Michelfelder is non-analogous art and not in the field of invention related to a gas generation system used to supply hydrogen to fuel cells. Michelfelder does not involve reforming of fuel, but rather treating reaction products resulting from the combustion of fuel to reduce contaminants emitted into the environment. (abstract). Therefore, one skilled in the art of fuel generation would definitely not take Michelfelder into account.

Additionally, one of skill in the art would not view Michelfelder as teaching to modify Barbir to place "the second location directly in front of the separator device." The filtering separator of Michelfelder is completely distinct from the separator device of the present invention. The filtering separator of Michelfelder separates solids from gases and recirculates solids (Col. 2, Line 62 to Col. 3, Line 8), whereas in the present invention, the separator device separates gases from gases and gases are recirculated. Therefore, Barbir with Michelfelder could not be combined by one of ordinary skill in the art to show "the gas generation system as recited in claim 1, wherein the second location is directly in front of the separator device."

Withdrawal of the rejection under 35 U.S.C. §103 (a) of claim 2 is respectfully requested.

Claim 4 was rejected under 35 U.S.C. 103(a) as being unpatentable over Barbir in view of Faye (US 2003/0170514).

Barbir is described above.

Faye discloses "a fuel cell device with a fuel cell unit and a conversion unit for converting fuel mixtures into a hydrogen-containing fluid stream." (paragraph [0002]).

Claim 4 recites "the gas generation system as recited in claim 1, further comprising an enrichment device configured to enrich the hydrogen-containing reformate gas with hydrogen and disposed between the reformer and the separator devices, wherein the second location is between the reformer and the enrichment device."

In view of arguments with respect to claim 1, withdrawal of the rejection to claim 4 is respectfully requested.

Also, neither Faye nor Barbir discloses the second recirculation location "between the reformer and the enrichment device," as claimed in claim 4. The Office Action admits that "Barbir does not disclose an enrichment device configured to enrich the hydrogen-containing reformate gas with hydrogen and disposed between the reformer and the separator devices, wherein the second location is between the reformer and the enrichment device." However, it is respectfully submitted, it is not possible for Faye to teach the "second location between the reformer and the enrichment device" when Faye does not disclose, and in fact teaches away, from recirculating residual gases. Faye

discloses discharging residual gases into the atmosphere, and not recirculating them. (paragraph [0038]). Because residual gases are not recirculated in Faye, there can be no recirculation of gases from a first location to a second location, and therefore no "second location" is disclosed in Faye. Therefore, Barbir and Faye cannot be combined to show all the limitations of claim 4.

Withdrawal of the rejection under 35 U.S.C. §103 (a) of claim 4 is respectfully requested.

Claims 9, and 11 to 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barbir in view of Keefer (US 2002/0098394 A1).

In view of arguments with respect to claim 1, withdrawal of the rejection to claims 9, and 11 to 15 is respectfully requested.

New Claims

Claims 17 to 20 have been added. Support for claims 17 to 20 can be found in the specification at, for example, paragraph [00010].

Consideration of new claims 17 to 20 is respectfully requested.

CONCLUSION

The present application is respectfully submitted as being in condition for allowance and applicants respectfully request such action.

Respectfully submitted,

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